DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 41-46, 50, 51, 53-67 and 77-79 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

a. Independent claim 41 has been amended to recite the limitation of wherein the particles of solid polymer *consist of* the solid polymer; within the originally filed specification, it is unclear as to whether this limitation is sufficiently supported. For example, the disclosure includes written description of encapsulation of the solid polymer, as well as the incorporation of additional materials therewith. However, it is unclear as to whether the solid polymer is explicitly disclosed as employed in a particle consisting only of the solid polymer as claimed.

b. Independent claim 41 has further been amended to recite wherein the polymer breakers included in the treatment fluid are *soluble* polymer breakers. There is insufficient support for this limitation within the disclosure as originally filed.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 41-46, 50, 51, 53-66 and 77-79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Todd (US 7,195,068 '068 herein) in view of Still et al. (US 7,166,560).

With respect to independent claim 41, '068 discloses a process for disrupting filter cake in an underground formation, which process comprises: dispersing in a treatment fluid a polymer capable of being converted by hydrolysis into one or more organic acids (col. 5, l. 44-58) and incorporating into the treatment fluid one or more soluble polymer breakers (col. 3, l. 28 - col. 3, l. 34); introducing the treatment fluid into said underground formation containing said filter cake (col. 6, l. 62 – col. 7, l. 47); and allowing the polymer to hydrolyze in the presence of water to produce organic acid such that acid soluble material within the filter cake or adjacent formation is dissolved (col. 5, l. 45-58; col. 6, l. 28- col. 7, l. 47).

'068 discloses wherein a polymer such as poly(ortho esters), aliphatic polyesters, lactides, poly(lactides), glycolides, poly(glycolides), poly(hydropxybutyrates) and poly(anhydrides) is included in the treatment fluid as a delayed release acid component (col. 6, l. 28- col. 7, l. 47). Such polymers are the same polymers as claimed by Applicant as the polymers dispersed in the treatment fluid (see instant claim 44), and, therefore, such polymers would, as Applicant's, be capable of being converted by hydrolysis into one or more organic acids. '068, however, fails to disclose wherein such delayed release acid components are provided as particles consisting of a solid of such delayed release acid components as claimed.

Still et al. teaches methods of generating acid downhole, wherein a solid acid precursor consisting of a material such as lactide, glycolide, polylactic acid and polyglycolic acid are added to a treatment fluid for the purpose of delaying and controlling the release of the acid upon hydrolysis of the solid acid-precursor at a desired downhole location; the particular solid acid-precursor employed is chosen so as to generate acid at a desired rate, after a suitable delay if needed, and, further, may be employed in conjunction with an acid-reactive material that is selected to accelerate acid generation to a suitable extent (abstract; col. 2, l. 16-27; col. 6, l. 34-col. 7, l. 7).

Since both '068 and Still et al. teach methods of controlling and delaying the generation of acid downhole, wherein the acid generated is generated from the same polymeric materials, and, further, wherein the delayed release acid component may be employed with an acid reactive material that accelerates the generation of the acid to a suitable extent, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solid particle consisting of the delayed release acid component of '068 as taught by Still et al. in order to insure the delayed release of acid therefrom at the desired well location.

With respect to depending claims 42-46, '068, in view of the solid polymer of '688, discloses wherein the polymer is a polyester, an aliphatic polyester, a polymer comprising one or more compounds selected from the groups as claimed (col. 5, l. 44-54).

With respect to depending claim 50, Still et al. further teaches the shape of the solid polymer selected from the group as claimed (col. 2, l. 50-53).

With respect to depending claim 51, '068 discloses incorporating a buffer into the treatment fluid (col. 6, l. 29-52, i.e., wherein the acid released from the delayed release acid

component alters the pH of the filter cake degradation compound, thereby functioning as a buffer therein).

With respect to depending claims 53 and 54, '068 discloses wherein the polymer breaker is a hydrolase enzyme, and, further, wherein the polymer breaker is a polysaccharide hydrolyzing enzyme (col. 6, l. 36-39).

With respect to depending claim 55, '068 discloses wherein the polymer breaker is an enzyme (col. 6, l. 36-39) which can hydrolyze a polymer selected from the group as claimed (col. 3, l. 22-24).

With respect to depending claims 56 and 57, '068 discloses wherein the polymer breaker is an oxidant, and, further, wherein the oxidant is selected from the group as claimed (col. 3, l. 28- col. 3, l. 34).

With respect to depending claim 58, '068 discloses wherein the polymer breaker is in the form of a delayed release preparation (col. 4, l. 35 - col. 5, l. 58).

With respect to depending claim 59, '068, in view of the solid polymer of Still et al., teaches wherein the treatment fluid is a gravel packing fluid which comprises one or more solid polymers and one or more polymer breakers (col. 7, l. 5-28).

With respect to depending claim 60, '068 discloses wherein the treatment fluid disrupts or degrades at least a portion of the filter cake and increases the permeability of the formation (col. 6, l. 53 – col. 7, l. 65).

With respect to depending claim 61, '068 discloses wherein at least a portion of the polymer remains in the underground formation and continuously releases organic acid and a

production chemical during hydrocarbon production or water injection until the polymer has completely hydrolyzed (col. 6, l. 53 - col. 7, l. 65).

With respect to depending claim 62, '068 discloses wherein the underground formation contains hydrocarbon or water and wherein the process further comprises recovering a hydrocarbon or water from the treated formation (col. 1, l. 39-55; col. 6, l. 62 – col. 7, l. 28).

With respect to depending claim 63, '068 discloses wherein the treatment fluid containing the solid polymer is introduced into the formation via a well bore which extends to the formation (col. 6, l. 62- col. 7, l. 65).

With respect to depending claims 64 and 65, '068 discloses wherein the filter cake degradation composition may be used in conjunction with a gravel pack operation wherein "other additives typically used with a gravel pack treatment in such an application may be present (col. 6, l. 62- col. 7, l. 28). The reference, however, fails to explicitly disclose wherein the treatment fluid further comprises an acid sensitive viscosifying agent and wherein the viscosity of the fluid is reduced by the acid generated by hydrolysis of the solid polymer, and, further, wherein the viscosifying agent is borate crosslinked guar gum as claimed. The Examiner hereby takes Official Notice in that it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ an acid sensitive viscosifying agent of borate crosslinked guar gum as claimed, wherein the viscosity of the fluid is reduced by the acid generated by hydrolysis of the solid polymer insofar as because borate crosslinked guar gums are known additives used to viscosify fluids employed in gravel packing operations, wherein the viscosity thereof is broken subsequent to the creation of the gravel pack.

With respect to depending claim 66, '068 discloses wherein the treatment fluid further comprises calcium peroxide and wherein the organic acid produced by hydrolysis of the solid polymer leads to the generation of hydrogen peroxide (col. 3, l. 43-52).

With respect to depending claim 77, '068 discloses wherein the polymer is a polymer which comprises one or more compounds selected from the group as claimed (col. 5, l. 44-54).

With respect to depending claim 78, '068 discloses wherein the treatment fluid is a gravel packing fluid (col. 6, l. 62-col. 7, l. 27) which, in view of '688, comprises one or more solid polymers.

With respect to depending claim 79, '068 discloses wherein the one or more soluble polymer breakers are one or more polymer breakers selected from the group as claimed (col. 3, l. 28 - col. 3, l. 34).

5. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over '068 in view of Still et al. as applied to claim 41 above, and further in view of Constien (US 2002/0142919 – cited previously).

'068 in view of Still et al. teaches the process as provided above with respect to claim 41 wherein '068 discloses the inclusion of a delayed release oxidizer in the filter cake degradation composition for the purpose of dissolving polysaccharide materials in the filter cake. The reference, however, fails to disclose wherein the composition includes ammonium bifluoride and wherein the organic acid produced by hydrolysis of the polymer leads to the generation of hydrogen fluoride as claimed.

Constien teaches a method of degrading filter cakes in a subterranean formation wherein strong acids are created in the well bore from reactive materials placed therein; for example,

ammonium bifluoride is included with a solid organic acid for the purpose of generating hydrogen fluoride upon hydrolysis of the solid organic acid so as to hydrolyze polysaccharide materials in the well bore.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to try a material such as ammonium bifluoride as the delayed release component in the process of '068 in order to produce hydrogen fluoride upon hydrolysis of the organic acid so as to hydrolyze and degrade polysaccharide materials contained within the filter cake.

Response to Arguments

6. Applicant's arguments and amendments submitted with respect to the rejection of claims as set forth in the previous action as being unpatentable over '068 in view of '688 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Applicant's amendments to independent claim 41.

Applicant notes that '068 and '688 teach multi-component particulates comprising a coating material of some form and an encapsulant material of some form. Applicant asserts that the instant claims, in contrast, involve dispersing in a treatment fluid particles consisting of a solid polymer. The Examiner would like to note that as a result of this amendment, the '688 reference has been reconsidered and a new grounds of rejection is set forth under 35 USC 103(a) of claim 41, as well as the claims dependent therefrom, under '068 in view of Still et al., wherein Still et al. teaches dispersing in a treatment fluid particles consisting of a solid polymer.

Applicant further notes that the present invention requires one or more soluble polymer breakers incorporated into the treatment fluid, prior to the introduction of the treatment fluid into the underground formation. Applicant asserts that the delayed release oxidizer components of '068, i.e., zinc, calcium and magnesium peroxides, are well known to be insoluble in aqueous solutions such as typical treatment fluids.

The Examiner would like to first note, that as presently written, independent claim 41 does not require that the polymer breakers be incorporated into the treatment fluid prior to the introduction of the treatment fluid into the underground formation; for example, no specific terminology is included in the claim to indicate a specific order to the steps claimed therein. The Examiner would like to further note that '068 discloses the same materials claimed by Applicant to be used as a polymer breaker in claim 57; for example, within claim 57, Applicant recites wherein the polymer breaker is a peroxide, and, therefore, a material disclosed by '068. Lastly, the Examiner would like to note that within independent claim 41, Applicant recites wherein "one or more soluble polymer breakers" is incorporated into the treatment fluid. There is no specific claim terminology that requires that the polymer breaker be soluble within an aqueous fluid, as Applicant notes at the bottom of page 9 of the remarks.

Therefore, for at least these reasons, the Examiner maintains the use of '068 as a primary reference in the rejection of the pending claims.

The Examiner would like to note that claims 64 and 65 were previously rejected by a taking of Official Notice by the Examiner. Since Applicant has not traversed the Examiner's statements made in the rejections thereof, the Examiner maintains that it was known in the art at the time the invention was made to employ an acid sensitive viscosifying agent of borate

crosslinked guar gum as claimed, wherein the viscosity of the fluid is reduced by the acid generated by hydrolysis of the solid polymer insofar as because borate crosslinked guar gums are known additives used to viscosify fluids employed in gravel packing operations, wherein the viscosity thereof is broken subsequent to the creation of the gravel pack as claimed.

With respect to the further rejection of claim 67 as being unpatentable over '068 in view of '688 and further, in view of Constien, Applicant asserts that claim 41 is not obvious from '068 in view of '688 and Constien fails to teach or suggest these features. The Examiner would like to note that, as set forth above, a new grounds of rejection of claim 41 as being unpatentable over '068 in view of Still has been provided. Since Applicant has presented no further arguments with respect to the specific teachings of Constien within the context of the subject matter claimed in claim 67, the grounds of rejection of claim 67 as being unpatentable over '068 in view of '688, and further in view of Constien has been set forth above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela M. DiTrani whose telephone number is (571)272-2182. The examiner can normally be reached on M-F, 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shane Bomar can be reached on (571)272-7026. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Angela M DiTrani/
Primary Examiner, Art Unit 3676

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